Calendar No. 85

100TH CONGRESS
1st Session

SENATE

REPORT
100-44

STAR SCHOOLS PROGRAM ASSISTANCE ACT

APRIL 21, 1987.—Ordered to be printed

Mr. KENNEDY, from the Committee on Labor and Human Resources, submitted the following

REPORT

together with

MINORITY VIEWS

[To accompany S. 778]

The Committee on Labor and Human Resources, to which was referred the bill (S. 778) to authorize a star schools program under which grants are made to educational telecommunications partnerships to develop, construct, and acquire telecommunications facilities and equipment in order to improve the instruction of mathematics, science, and foreign languages, and for other purposes, having considered the same, reports favorably thereon with an amendment in the nature of a substitute and recommends that the bill as amended do pass.

I. SUMMARY OF THE BILL

S. 778, the Star Schools Program Assistance Act, would add a new Title IX, the Star Schools Program Act, to the Education for Economic Security Act. The Star Schools Program addresses two critical needs in the rebuilding of our educational system to meet domestic and international challenges. The Nation's students must have access to basic and advanced courses in mathematics, science, and foreign languages, and these courses must be of the highest quality.

The Star Schools Program would provide demonstration grants to partnerships, including educational institutions, educational agencies, and entities with telecommunications networking exper-

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tise. These partnerships are to use telecommunications technology (satellite, microwave, fiber optic, and cable technologies, among others) to deliver courses in mathematics, science, foreign language, and possibly other subject areas to elementary and secondary schools, particularly those serving disadvantaged students, those with scarce resources, and those with limited access to courses in these critical subject areas, as well as to institutions of higher education, to teacher training centers, and to industry. Not only would instructional programs for students be made available through the Star Schools Program, but teachers would receive the additional training they need to better serve their students, and employees would be able to upgrade their skills, retrain for new jobs, or earn advanced degrees without leaving the work site.

The program would authorize $100 million over the 5-year period, FY 1988 through FY 1992, with a $60 million limit on any annual appropriation. Any individual demonstration grant, awarded competitively by the U.S. Secretary of Education, could not exceed $20 million and is not intended to be renewable. Such grants would generally be used to purchase telecommunications hardware. Other authorized expenditures include technical assistance to train elementary and secondary school teachers in the use of the telecommunications facilities, and development of educational programming for use on such a network. Priority for the awarding of grants would be given to those partnerships whose networks would serve more than one state.

Each partnership must report to the U.S. Secretary of Education all available courses of instruction and materials transmitted by satellite, indicating the satellite on which they will be transmitted and the time of transmission. The Secretary is to compile and disseminate this information to all State educational agencies. This will allow states which are not formally a part of a network but which have satellite receiving facilities to benefit by being able to access programming being transmitted over a satellite.

The Office of Technology Assessment, upon request, is to evaluate the telecommunications networks supported by the demonstration grants and to study the feasibility of building and launching a satellite dedicated for educational purposes.

II. Legislative History

The Senate Labor and Human Resources Committee held two hearings directly focused on the use of telecommunciations technology to address critical needs within our Nation's educational system—one in Charlestown, Massachusetts on February 27, 1987; the second in Washington, D.C. on March 11, 1987. The bill was introduced by Senator Kennedy, for himself and Senators Pell, Matsunaga, Dodd, Mikulski, Bradley, Conrad, and Glenn, on March 18, 1987, and referred to the Committee on Labor and Human Resources. The Committee met and ordered the bill reported with amendment on March 25, 1987.

III. Background and Need for the Legislation

SUMMARY

The economic battles of tomorrow are being fought in the classrooms of today, and the news from the front is not good. In survey after survey, American students are at the back of the class in math and science achievement. Japanese students score twice as high as our students in chemistry and math achievement. It should come as no surprise that the Japanese also have twice as many engineers working in their industries and have twice as many patents per capita as we do.

Let's be clear about causes: American students are as smart as any in the world and, given the resources, they will meet and beat the competition every time. But our students are not getting the training they need to succeed in the economy of the future. Only 35% of the high schools in America even offer a physics course. Even where courses are offered, the instructors are often not equipped to teach them. The National Science Teachers Association estimates that 30% of all math and science teachers in this country are completely unqualified or seriously underqualified to teach these subjects. And this will worsen quickly unless we act now: by 1995, the National Science Board reports that we will need twice as many teachers in math and science as we have today. But for every qualified math or science teacher entering the field, thirteen are leaving. It is estimated that the cost of a national program to train, hire and upgrade the Nation's math and science teachers so that American students would have qualified instruction available would be between $10 billion and $20 billion.

Yet, the costs to this nation of a continued failure to teach math and science to our children will be even more enormous. The very least we will lose will be billions upon billions of dollars in trade revenue. The true cost of our inaction will be the lost talents of an entire generation of our people, ground we shall never regain.

This legislation is a step towards a better future, called "Star Schools". The idea is to harness satellites and other technologies to reduce the shortage of qualified teachers and close the gaps that plagues so many of our schools, especially in science and mathematics. By making satellite time and other technologies available to teachers and students on a regular basis, we can make quality education and instruction far more widely and equally available than it is today—with a satellite dish outside the door, even a one-room schoolhouse can tap a whole world of knowledge.

The technology is available, and the cost of Star Schools is only a tiny fraction of the cost of Star Wars. And there is another difference—Star Schools can work.

Today the Nation is engaged in a major effort to strengthen and rebuild its system of elementary, secondary, and higher education. The task before us is formidable; the consequences of failing to rise to this challenge are serious. In its 1983 report entitled "Educating Americans for the 21st Century", the National Science Board Commission on Precollege Education in Mathematics, Science and Technology put it bluntly:

> Alarming numbers of young Americans are ill-equipped to work in, contribute to, profit from and enjoy our increasingly technological society. Far too many emerge from the Nation's elementary and secondary schools with an inadequate grounding in mathematics, science and technology. As a result, they lack sufficient knowledge to acquire the training, skills and understanding that are needed today and will be even more critically needed in the 21st century. This situation must not continue—improved preparation of all students in the fields of mathematics, science and technology is essential to the maintenance and development of our Nation's economic strength, to its military security, to its continued commitment to the democratic ideal of an informed and participating citizenry and to fulfilling personal lives for its people.

Students' lack of understanding and lack of preparation are not limited to the mathematical and scientific areas of the curriculum. Instruction in foreign languages, critical to a nation engaged in an international economic marketplace, is another important weakness of the educational system. The National Commission on Excellence in Education, in "A Nation At Risk", stated, with regard to acquiring proficiency in a foreign language:

> We believe it is desirable that students achieve such proficiency because study of a foreign language introduces students to non-English-speaking cultures, heightens awareness and comprehension of one's native tongue, and serves the Nation's needs in commerce, diplomacy, defense, and education.

"Educating Americans for the 21st Century" and "A Nation At Risk" were part of a wave of educational reform reports that washed over the Nation beginning in 1983. In response, State and local leaders in the educational, political, and business arenas have been working together to raise the educational performance standards required of students and teachers, to address some of the financial and working condition needs of the teaching profession, and to require students to take more courses in core subjects such as mathematics, science, and foreign language.

It is clear that our students have two fundamental needs—access and quality. They must have far greater exposure to mathematics, science, and foreign language courses, particularly at advanced levels. The must also be able to take courses in these subject areas that are of the highest quality. While State actions to increase requirements for high school graduation are laudable, the may be ineffective if (1) the required courses are not offered in all our high schools, (2) the standards act, not as floors, but as ambition-stifling ceilings, or (3) the requirements are met through skillful renaming of inadequate courses.

A survey by the U.S. Department of Education demonstrates our dilemma. The Department found that of the Nation's approximately 15,667 secondary schools only 5,576 or 36 percent offered a physics course, and 13,999 or 89 percent offered a chemistry course. It should not be surprising that the National Science Board, in "Sci-

ence Indicators: The 1985 Report", concluded that most students have no exposure to science beyond the 10th grade.

The same findings apply to foreign languages and mathematics, particularly advanced courses. Although it is posited that more than 2 years of foreign language study is required for all real proficiency, 1982 high school seniors throughout their high school careers had completed, on average, only about 1 year of instruction in a foreign language. Only 28 percent had more than 2 years of foreign language study. In the early 1980s, 28 percent of high school students attended schools not offering third-year Spanish; 35 percent attended schools without third-year French; and 61 percent attended schools not providing third-year German. Languages other than these are even less likely to be available in our high schools. For example, only 5 percent of all high school students had access to Russian language courses in their schools.

With regard to mathematics study, the story is similar. Recent data show that high school graduates take on average about 2.7 years of mathematics; those aiming for college take slightly more. Significantly, relatively few high school students take advanced mathematics courses, such as algebra II (only 31 percent), trigonometry (only 7 percent), or calculus (only 6 percent).

Startlingly, when compared with students in other countries, studies indicate that students in the U.S. have not been given the same opportunity to learn as their counterparts abroad. The International Association for the Evaluation of Education Achievement reports that among eighth grade students, the opportunity to learn algebra in the U.S. ranked 12th lowest of 16 developed nations. Among twelfth grade college preparatory mathematics students, the U.S. ranked 11th lowest out of 12 developed countries in providing the opportunity to learn elementary functions and calculus.

Moreover, these are national averages. The situation appears to be worse for various sub-groups of students and communities. Racial and ethnic minorities are much less likely to study any foreign language during high school than are whites—37 percent of black and 38 percent of Hispanic students do; 49 percent or nearly half of white students do. In science and mathematics, racial and ethnic differences are much less significant when it comes to course-taking in mathemtics and science, yet conceivably the precise kinds of courses (for example, business math as opposed to algebra II) taken by different groups do vary. Variation in socioeconomic status of students is associated with mathematics and science enrollment. Those in the top quarter of socioeconomic status complete, on average, approximately 30 to 40 percent more years of science and math than do students in the lowest quarter. Students in the highest socioeconomic quartile finish 2.7 years of science and 3.1 years of math; those in the lowest quartile complete only 1.9 years of science and 2.3 years of math. Students in rural schools may be at a disadvantage, particularly with regard to foreign languages. Fully 50 percent of rural high school students are enrolled in schools not offering third-year Spanish; 56 percent are in schools without a third-year French course; and 83 percent are in schools without a third-year German course.

There are real people behind these numbers. The Committee heard testimony from talented high school students who, by sacri-

ficing time, energy, and finances, were able to take advanced math and science courses during their high school careers, even when their high schools did not offer more advanced courses. Some enrolled in special college courses during the summer. Yet others reported that, once they had exhausted their schools' curricular offerings in these subject areas, they could go no further while in high school. Repeatedly, the Committee was told, not just by the students, but by panels of teachers, that many high schools do not or cannot offer advanced courses. Many schools which have offered such courses in the past are being forced to drop them from current course offerings.

Budgetary constraints, among other factors, appear to be dictating what our students can learn. Among the factors accounting for the lack in some schools of basic and advanced courses in math, science, and foreign languages are the following: these courses are not required; some school systems cannot afford to offer advanced courses to only a handful of students; and teachers certified to teach these specific subject areas are not easily found—good teachers who might attract more students to these subject areas may be even rarer.

The shortage of qualified teachers is particularly important. The National Scien Board found that available surveys on teacher shortages indicate that current shortages exist in science and mathematics. While headcounts of unfilled teaching positions find serious shortages limited to specific subject areas, e.g., physics, opinion surveys of university placement officials and state science supervisors conclude that serious shortages are found in most math and science fields. The executive director of the National Science Teachers Association has estimated that about 30 percent of all individuals currently teaching math and science in high schools are "either completely unqualified or severely underqualified to teach those subjects" and over 40 percent of the mathematics and science teaching force will retire by 1992.

The condition of our precollege mathematics, science, and foreign language instruction has adverse consequences throughout the Nation's educational system. The level of instruction offered at the collegiate level appears to be suffering. For example, in 1983–84, 71 percent of all higher education institutions offered 1 or more remedial mathematics courses. Fully 25 percent of all college freshmen had to enroll in those remedial math courses.

Not surprisingly, limited access to courses has a direct effect on performance in those subject areas. The Committee's sense of urgency about responding to this situation arises, in part, from its consideration of the educational performance of students in countries that are our economic competitors. The recent international mathematics study, by the International Association for the Evaluation of Education Achievement, shows clearly how far behind our students have fallen academically. For students in the 8th grade or the equivalent, U.S. students answered correctly, on average, only 46.0 percent of the mathematics questions. That performance placed the U.S. next to last when compared to 13 other developed countries, well below the average for all 14 countries of 52.0, and dramatically below the average for Japanese students of 63.5 percent. The U.S. performance appears no better when one focuses

on the performance of advanced mathematics students in the 12th grade. For example, in algebra, the U.S. advanced math students on average, correctly answered 43.7 percent of the items, while the average for advanced math students in all participating developed countries was 49.0 percent and the average for advanced math students in Japan was 57.1 percent.

OBSERVATIONS ON EVALUATING TELECOMMUNICATIONS TECHNOLOGIES IN EDUCATION

From 1983 to 1986, the Minnesota State Department of Education conducted extensive research on eleven Technology Demonstration Sites that implemented two-way interactive television in that state. The results and findings of this evaluation confirm the effectiveness and importance of telecommunications in education. The Minnesota study found that:

(1) ITV allows schools to offer a wider range of elective courses and permits students greater access to subject matter.

(2) Teachers require training, preparation, and support to deal successfully with teaching on ITV. When these factors are present, teachers can adapt to and enjoy teaching on ITV. Seventy-five percent of the teachers who taught on ITV would choose to do so again.

(3) Students enjoy learning on ITV and are motivated by it.

(4) No systematic, statistically significant difference in achievement was found between students taking courses traditionally and those in ITV sections. The medium does not appear to influence achievement.

(5) ITV seems to be particularly appropriate for language and math instruction, for which it is heavily used.

LEGISLATIVE RESPONSE

The Star Schools Program Assistance Act will respond to the critical needs the Committee has identified—the need for all of our students to have access to basic and advanced courses in mathematics, science, and foreign languages, and the need for students to have access to courses of the highest quality. The legislation will do so by taking advantage of recent developments in telecommunications technology and a cooperative spirit that now exists in this country committed to improving our educational system. Its authorization is $100 million over a 5-year period, with a $60 million limit on any annual appropriation. By permitting individual demonstration grants of up to $20 million, the program will provide adequate levels of funding to ensure the successful initiation of educational telecommunications networks.

The demonstration grants, to be awarded competitively by the U.S. Secretary of Education to eligible telecommunications partnerships, will provide direct benefits to students and teachers by providing access to the mathematics, science, and foreign language courses they currently lack. Teachers will be assisted in integrating the use of the available telecommunications equipment and networks into the regular curriculum. Furthermore, by providing teachers with training in their subject areas, the Star Schools Program will help to increase the number of high quality teachers in

these subject areas. In addition, funds may be used for the development of programming to be used on a telecommunications network.

The bill focuses assistance on disadvantaged students and on areas with scarce resources and limited access to courses in these subject areas. Not less than 50 percent of the funds made available in any fiscal year shall benefit local educational agencies eligible to receive assistance under Chapter I of the Education Consolidation and Improvement Act.

Eligible partnerships may include local educational agencies with a significant number of schools eligible for Chapter I assistance. Partnerships applying for funding must provide assurances that they will make a significant portion of their facilities, equipment, technical assistance, and programming available to elementary and secondary schools in local educational agencies with a high percentage of students counted for purposes of allocating Chapter I funds. The Secretary is to give priority to applications from partnerships demonstrating that their course offerings will provide significant new resources to traditionally underserved populations and areas with scarce resources and limited access to math, science, and foreign language courses. Further, priority is given to applications from partnerships that will serve the broadest range of institutions, including particularly schools with significant numbers of Chapter I students.

By requiring that these demonstration grants be awarded only to partnerships, the Star Schools Program can promote cooperation between elementary and secondary schools, institutions of higher education, and industry, among others, in pursuit of quality education. The Secretary is to give priority to applications demonstrating that the telecommunications partnership has secured the cooperation of public and private educational institutions, State and local government, and industry in planning its network. In addition, the priority that the Secretary is to give to applications from partnerships intending to serve multi-state areas will also be beneficial to an overall pursuit of educational excellence, a pursuit not limited by State borders.

Finally, reports by the Office of Technology Assessment evaluating the uses of these demonstration grants and the study of the feasibility of an educational satellite, if requested, would guide a broader application of what is accomplished through the Star Schools Program.

IV. Committee Views

S. 778, the Star Schools Program Assistance Act, amends the Education for Economic Security Act by adding a new Title IX, which may be cited as the Star Schools Program Act. The Committee is placing the Star Schools Program in the Education for Economic Security Act, the Federal response to the current problems in improving mathematics, science, and foreign language instruction and achievement.

Section 902 of the title provides that the Star Schools Program is intended to encourage improvement in mathematics, science, and foreign language instruction through the privision of demonstration grants to telecommunications partnerships. These grants are

to be used for the development, construction, and acquisition of telecommunications facilities and equipment, and for technical assistance and programming. The Committee notes that the Star Schools Program is intended primarily to provide assistance in meeting the costs of acquiring the telecommunications facilities and equipment necessary to support the telecommunications network focusing on improving educational instruction. Funds may also be used for the development and dissemination of instructional materials and programming. However, it is contemplated by the Committee that the larger onetime costs of the establishment of a network will involve the initial purchase of hardware as well as sufficient funding for training and programming. Grants solely for the purpose of programming would not be given priority.

The Committee notes that there are some school districts across the country which are currently engaged in 'distance learning' through various kinds of telecommunications equipment. These illustrate on a small scale what the Committee hopes to accomplish on a larger scale, that is the sharing of educational resources with school districts which would otherwise have little or no access to them. In most instances, such projects have been tried on a small scale with a few schools or school districts linked together, using telecommunications facilities which only reach limited distances. It is the intent of the Committee to allow larger scale sharing of resources by providing funding needed to establish networks on a statewide or multi-state level, which in turn will allow the greatest numbers of students to receive and participate in the best quality courses and programs.

The Committee intends that Star Schools funds have as broad an impact as possible. Therefore, in view of the the existence in many states of extensive telecommunications systems, including educational/public broadcast stations, Instructional Television Fixed Service (ITFS), microwave links, or other facilities, the Committee considers it important that project applicants provide assurances that a project would not duplicate existing available comparable production, transmission or receiving equipment, but rather would compliment such equipment.

Section 903 provides that, for the period beginning October 1, 1987, and ending September 30, 1992, the title authorizes $100 million, with an annual appropriation limit of $60 million. An individual demonstration grant cannot exceed $20 million. The Committee intends that only one grant be made to any specific partnership during the existence of the program. In addition, not less that 50 percent of any annual appropriation for this program must be used to meet the costs of facilities, equipment, teacher training or retraining, technical assistance, or programming for local educational agencies eligible to receive assistance under Chapter I of the Education Consolidation and Improvement Act. The Committee is particularly concerned about improving math/science instruction for traditionally underserved and disadvantaged populations. Therefore, the Committee intends by this language that 50 percent of the funds to grantees under this act be spent to improve resources available to Chapter I eligible LEA's and, within those LEA's, to further target the poorest schools and other underserved populations in the geographic area covered by the telecommunications

network. By making telecommunications equipment and teacher training programs available to Chapter I eligible schools, in particular, we ensure that students in attendance at those schools will benefit from improved instructional offerings in mathematics and science. The Committee believes that it is in the national interest to encourage students in attendance at Chapter I eligible schools to pursue careers in math and science. In order to meet that objective, we must improve instructional opportunities available to these students at the earliest elementary grades.

Section 904 provides that eligible telecommunications partnerships take one of two forms: a public agency or corporation established for the purpose of developing and operating a telecommunications network to improve the education offered by educational institutions, teacher training centers, health institutions and industry (such an egency or corporation must contain representation of the interests of elementary and secondary schools eligible for Chapter I assistance), or a partnership among three or more of the following—a local educational agency with a significant number of elementary and secondary schools eligible for Chapter I assistance, a State educational agency, a higher education institution, a teacher training center, or a public agency, a private nonprofit organization, or public broadcasting entity with telecommunications network expertise. This language is not intended to be an exclusive list of entities which may be involved in a telecommunications network established under this act. Other entities may form partnerships or contractural relationships with those entities specified as eligible to form a partnership for the purpose of applying for a grant. Indeed, the Committee would encourage telecommunications partnerships to form such alliances with experienced entities to benefit from their expertise. And it is in keeping with other titles of the Act as well as this title's purposes that cooperative educational ventures between business and government be promoted.

An eligible telecommunications partnership must be organized on a statewide or a multi-state basis.

With respect to public broadcasting entities, the Committee notes that the federal government, over the last twenty years, has invested over $300 million in purchasing and maintaining the public broadcasting interconnection system. Public radio and television use these facilities to provide quality cultural, educational and news programming across the country, from rural farm communities and remote Alaskan villages to our largest urban centers.

Public broadcasting's record of efficient, effective use of federal funds and ability to leverage non-federal resources with those funds merits continuing support. The Committee believes that public broadcasting is eligible for participation in this program and that projects funded through the "Star Schools Program" should not duplicate but complement and build on this nationwide distribution system, where appropriate. Public radio and television's expertise in both the development and production of quality programming and their ability to distribute programs to the widest audience in the most cost efficient manner should be utilized in meeting the objectives of this legislation.

Section 905 delineates the contents of applications for demonstration grant assistance. Such applications must describe the facilities,

equipment, and technical assistance to be supported by the grant. The funds can be used for the creation and acquisition of statewide or multi-state educational telecommunications networks and technology resource centers; microwave, fiber optics cable and satellite transmission equipment; reception facilities; satellite time; production facilities; other telecommunications equipment able to serve wide geographic areas; training elementary and secondary teachers, particularly those in Chapter I schools, in the use of telecommunications facilities and equipment; and development of educational programming. The required applications must show that the telecommunications partnership has sufficiently surveyed and analyzed its service area to ensure that its service will increase the availability of mathematics, science, and foreign language courses. The required applications must also: describe intended teacher training policies for the use of telecommunications technology; ensure that the financial interest of the U.S. in the acquired equipment and facilities will be protected for their useful life; ensure that a significant portion of the facilities, equipment, and activities of the partnership will assist schools in local educational agencies with a high percentage of Chapter I children; describe how traditionally underserved students will benefit; and provide additional assurances reasonably required by the Secretary.

The Committee stresses that the Star Schools Program should, to a great extent, assist telecommunications partnerships that provide interactive programming and courses of instruction. The hearings before the Committee clearly demonstrated that the technology is available to support a much wider use of interactive telecommunications activities than is currently found. The possibility of immediate interaction between student and teacher, no matter how far away that teacher might be, is critical for advanced study in mathematics, science, and foreign languages where such courses are not otherwise available.

Section 905(c) of the bill specifies priorities that the Secretary must give in approving applications. The first priority is to applicants which demonstrate a concentration and quality of math, science, and foreign language resources which, by their distribution through the eligible telecommunications partnership, will offer significant new educational opportunities to network participants. Here and throughout this act, we have included language which places a priority in awarding grants to applications which serve the traditionally underserved and areas with scarce resources and limited access to courses in mathematics, science, and foreign languages. Our intent is to focus use of funds under this act on these needy populations. While the bill specifically reserves 50 percent of the funds for elementary and secondary school districts eligible for Chapter I assistance, we have added this additional language to indicate that Star Schools should be further targeted within Chapter I eligible districts to serve the neediest children within those districts. The phrase "areas with scarce resources and limited access to courses in mathematics, science, and foreign languages" is also intended to recognize the needs of rural areas and rural school districts. The need for the Star Schools program is greatest in schools located in rural areas and rural school districts because many of

these schools are currently unable to provide courses even of a minimum quality or variety in these subject areas.

Priority must also be given to applications showing that: the network was planned with the involvement of public and private educational institutions, State and local government, and industry; the partnership will serve the broadest range of institutions, including schools serving significant numbers of Chapter I students, programs offering instruction in non-school settings, higher education institutions, teacher training centers, research institutes, and private industry; a significant number of educational institutions have agreed to participate; the partnership will serve more than one State; and, the partnership will meet the needs of groups traditionally excluded from math and science careers due to discrimination, lack of opportunity, or economic disadvantage. Finally, the Secretary must ensure that there is an equitable geographic distribution of grants. This provision is intended to ensure that the limited funds made available under the program will be used to demonstrate how telecommunications can be used in a variety of settings around the country.

It is the intent of the Committee that applications which provide telecommunciations programming for teacher training shall receive priority in awarding a grant. The Committee recognizes that instructions through telecommunciations can be particularly effective in the area of teacher training. This is especialy true of inservice training and retraining, This new mode of instruction would enable teachers who cannot leave school grounds during the day, or those who live or work far away from institutions of higher education, to take courses during their free periods, as well as before or after school. Such instruction would enable teachers to learn new subject areas or to expand their knowledge.

Furthermore, under this act, each application shall include plans for adequate teacher training for the use of the telecommunications facilities, equipment, and instruction. Sufficient teacher training will enable teachers to effectively integrate with other classrooms and instruction by other teachers into their own curriculum design. In this manner, telecommunications instruction can be woven into the class plan and school day, ensuring maximum use of this new mode of instruction.

Section 906 requires any funded partnership to provide the Secretary with a listing and description of all courses and materials that will be transmitted over satellite, the satellite over which the transmissions will take place, and the time of the transmissions. The Secretary is to compile this information and disseminate it to all State educational agencies. The Committee intends this listing to be sufficiently detailed to enable all educational institutions with the capacity to receive such satellite transmissions to be able to participate in the transmitted courses or receive the transmitted materials. The purpose of this requirement is to enable states which are not formally a part of a network but which have satellite receiving facilities to benefit by receiving programming transmitted over a satellite.

Section 907 describes the evaluation of the use of all demonstration grants. Such evaluation is to be performed by the Office of

Technology Assessment, upon request, beginning after September 30, 1987.

Section 908 provides that, upon request, the Office of Technology Assessment is to prepare a study of the costs associated with designing , building, and launching a satellite for education purposes. This study is also to consider the ability of users to repay the costs of this satellite. The Congress is to be notified if the Office of Technology Assessment concludes that the costs of such a satellite would be repaid by users within 10 years.

Section 909 defines the terms used in the Star School Program. The Committee stresses that the term "State" is given a broad definition, including not only the 50 states, the District of Columbia, and Puerto Rico, but also the trust territories.

V. Vote in Committee

S. 778 was brought up for markup at the Labor and Human Resources Committee Executive Session on March 25, 1987. At that time Senator Kennedy offered an amendment in the nature of a substitute. The bill as amended was reported favorably from the Committee by a vote of 13 to 3, as follows:

YEAS	NAYS
Kennedy	Thurmond
Pell	Quayle
Metzenbaum	Humphrey
Matsunaga	
Dodd	
Simon	
Harkin	
Adams	
Mikulski	
Hatch	
Stafford	
Weicker	
Cochran	

VI. Cost Estimate

U.S. Congress,
Congressional Budget Office,
Washington, DC, April 6, 1987.

Hon. Edward M. Kennedy,
Chairman, Committee on Labor and Human Resources,
U.S. Senate, Washington, DC.

Dear Mr. Chairman: The Congressional Budget Office has prepared the attached cost estimate for S. 778, the Star Schools Program Assistance Act, as ordered reported by the Senate Committee on Labor and Human Resources on March 25, 1987.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,

Sincerely,

Edward M. Gramlich,
Acting Director.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: S. 778.

2. Bill title: Star Schools Program Assistance Act.

3. Bill status: As ordered reported by the Senate Committee on Labor and Human Resources on March 25, 1987.

4. Bill purpose: The purpose of this bill is to authorize demonstration grants to education partnerships to encourage improved instruction in mathematics, science, and foreign languages through the use of telecommunications networks. This bill is subject to subsequent appropriations action.

5. Estimated cost to the Federal Government:

[By fiscal year, in millions of dollars]

	1988	1989	1990	1991	1992
Telecommunications grants:					
Authorization level	60	40			
Estimated outlays	7	32	31	31	9

The costs of this bill fall within function 500.

Basis of estimate

S. 778 authorizes a total of $100 million in grants to partnerships from 1988 through 1992. The partnerships would be charged with developing and operating educational telecommunications networks. The bill limits appropriations in any year to $60 million, but does not specify the timing of funding over the five years. For the purposes of this cost estimate, CBO assumes maximum funding in 1988, with the remainder to be funded in 1989. However, other funding patterns over the five years are possible.

Outlay estimates were made assuming the current spending pattern of similar telecommunications grant programs.

6. Estimated cost to State and local governments: The Congressional Budget Office has determined that the budgets of state and local governments would not be affected directly by the enactment of this bill.

7. Estimate comparison: None.

8. Previous CBO estimate: None.

9. Estimate prepared by: Ken Pott.

10. Estimate approved by: James L. Blum, Assistant Director for Budget Analysis.

VII. Regulatory Impact Statement

The Committee has determined that there will be minimal increases in the regulatory burden imposed by this bill.

VIII. Section-by-Section Analysis

Section 1. Provides that the act is to be cited as Star School Program Assistance Act.

Section 2. Provides that the Education for Economic Security Act is amended by the addition of a new Title IX:

Section 901 of the new title provides that it is to be cited as the Star Schools Program Assistance Act.

Section 902 provides the statement of purpose for the title. The Star Schools Program is to encourage the improvement of mathematics, science, and foreign language instruction through the use of telecommunications networks.

Section 903 describes the demonstration grant program authorized. Grants are to be made to eligible telecommunications partnerships for developing, constructing, and acquiring telecommunications facilities and equipment. This section also provides the funding authority—$100 million over a 5 year period, with a limit of $60 million in any one year. This section sets a limit for any individual grant of $20 million.

Section 904 defines the eligible telecommunications partnerships.

Section 905 describes the applications for demonstration grant assistance that must be submitted to the Secretary of Education. It also delineates the elements in applications to which the Secretary must give priority in selecting applications for funding.

Section 906 provides for the gathering of information on the satellite transmission of curriculum and its dissemination by the Secretary to all State educational agencies.

Section 907 describes the evaluation of the Star Schools grant that the Office of Technology Assessment is to perform upon request.

Section 908 describes the feasibility study of an educational satellite that is to be conducted by the Office of Technology assessment upon request.

Seciton 909 defines the following terms: educational institution, institution of higher education, local educational agency, public broadcasting entity, Secretary, State educational agency, and State.

IX. Changes in Existing Law

In compliance with rule XXVI paragraph 12 of the Standing Rules of the Senate, the following provides a print of the statute or the part of section thereof to be amended or replaced (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

Education for Economic Security Act

AN ACT To provide assistance to improve elementary, secondary, and postsecondary education in mathematics and science; to provide a national policy for engineering, technical, and scientific personnel; to provide cost sharing by the private sector in training such personnel; to encourage creation of new engineering, technical, and scientific jobs; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Education for Economic Security Act".

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TITLE IX—STAR SCHOOLS PROGRAM

SHORT TITLE

SEC. 901. This title may be cited as the "Star Schools Program Assistance Act".

STATEMENT OF PURPOSE

SEC. 902. It is the purpose of this title to encourage improved instruction in mathematics, science, and foreign languages through a star schools program under which demonstration grants are made to eligible telecommunications partnerships to enable such eligible telecommunications partnerships to develop, construct, and acquire telecommunications audio and visual facilities and equipment and obtain technical assistance for the use of such facilities.

PROGRAM AUTHORIZED

SEC. 903. (a) GENERAL AUTHORITY.—the Secretary is authorized, in accordance with the provisions of this title, to make grants to eligible telecommunications partnerships to develop, construct, and acquire telecommunications facilities and equipment and for technical assistance.

AUTHORIZATION OF APPROPRIATIONS.—(1) There is authorized to be appropriated $100,000,000 for the period beginning October 1, 1987, and ending September 30, 1992.

(2) No appropriation in excess of $60,000,000 may be made in any fiscal year pursuant to paragraph (1) of this subsection.

(c) LIMITATIONS.—(1) A demonstration grant made to an eligible telecommunications partnership under this title may not exceed $20,000,000.

(2) Not less than 50 percent of the funds available in any fiscal year under this Act shall be used for the cost of facilities, equipment, teacher training or retraining, technical assistance, or programming, for local educational agencies which are eligible to receive assistance under title I of the Elementary and Secondary Education Act of 1965 (as modified by chapter 1 of the Education Consolidation and Improvement Act of 1981).

ELIGIBLE TELECOMMUNICATIONS PARTNERSHIPS

SEC. 904. (a) GENERAL RULE.—In order to be eligible for demonstration grants under this title, an eligible telecommunications partnership shall consist of—

(1) a public agency or corporation established for the purpose of developing and operating telecommunications networks to enhance educational opportunities provided by educational institutions, teacher training centers, health institutions, and industy, except that any such agency or corporation shall contain representation of the interests of elementary and secondary schools who are eligible to participate in the program under title I of the Elementary and Secondary Education Act of 1965 (as modified by chapter 1 of the Education Consolidation and Improvement Act of 1981); or

(2) a partnership which includes three or more of the following which will provide a telecommunications network,

(A) a local educational agency, which has a significant number of elementary and secondary schools which are eligible for assistance under title I of the Elementary and Secondary Education Act of 1965 (as modified by chapter 1 of the Education Consolidation and Improvement Act of 1981),

(B) a State educational agency,

(C) an institution of higher education,

(D) a teacher training center, or

(E)(i) a public agency with experience or expertise in the planning or operation of a telecommunications network,

(ii) a private nonprofit organization with such experience, or

(iii) a public broadcasting entity with such experience.

(b) SPECIAL RULE.—An eligible telecommunications partnership must be organized on a statewide or multistate basis.

APPLICATIONS

SEC. 905. (a) APPLICATION REQUIRED.—Each eligible telecommunications partnership which desires to receive a demonstration grant under this title may submit an application to the Secretary, at such time, in such manner, and containing or accompanied by such information as the Secretary may reasonably require.

(b) CONTENTS OF APPLICATION.—Each such application shall—

(1) describe the telecommunications facilities and equipment and technical assistance for which assistance is sought which may include—

(A) the design, development, construction, and acquisition of State or multistate educational telecommunications networks and technology resource centers;

(B) microwave, fiber optics, cable, and satellite transmission equipment;

(C) reception facilities;

(D) satellite time;

(E) production facilities;

(F) other telecommunications equipment capable of serving a wide geographic area;

(G) the provision of training services to elementary and secondary school teachers (particularly teachers in schools receiving assistance under title I of the Elementary and Secondary Education Act of 1965 (as modified by chapter 1 of the Education Consolidation and Improvement Act of 1981)) in using the facilities and equipment for which assistance is sought; and

(H) the development of educational programming for use on a telecommunications network;

(2) demonstrate that the eligible telecommunications partnership has engaged in sufficient survey and analysis of the area to be served to ensure that the services offered by the telecommunications partnership will increase the availability of courses of instruction in mathematics, science, and foreign languages;

(3) describe the teacher training policies to be implemented to ensure the effective use of the telecommunications facilities and equipment for which assistance is sought;

(4) provide assurances that the financial interest of the United States in the telecommunications facilities and equipment will be protected for the useful life of such facilities and equipment;

(5) provide assurances that a significant portion of the facilities, equipment, technical assistance, and programming for which assistance is sought will be made available to elementary and secondary schools of local educational agencies which have a high percentage of children counted for the purpose of title I of the Elementary and Secondary Education Act of 1965 (as modified by chapter 1 of the Education Consolidation and Improvement Act of 1981);

(6) describe the manner in which traditionally underserved students will participate in the benefits of the telecommunications facilities, equipment, technical assistance, and programming assisted under this Act; and

(7) provide such additional assurances as the Secretary may reasonably require.

(c) APPROVAL OF APPLICATION; PRIORITY.—The Secretary shall, in approving applications under this title, give priority to applications which demonstrate that—

(1) a concentration and quality of mathematics, science, and foreign language resources which, by their distribution thorough the eligible telecommunications partnership, will offer significant new educational opportunities to network participants, particularly to traditionally underserved populations and areas with scarce resources and limited access to courses in mathematics, science, and foreign languages;

(2) the eligible telecommunications partnership has secured the direct cooperation and involvement of public and private educational institutions, State and local government, and industry in planning the network;

(3) the eligible telecommunications partnership will serve the broadeast range of institutions, including public and private elementary and secondary schools (particularly schools having significant numbers of children counted for the purpose of title I of the Elementary and Secondary Education Act of 1965 (as modified by chapter 1 of the Education Consolidation and Improvement Act of 1981)), programs providing instruction outside of the school setting, institutions of higher education, teacher training centers, research institutes, and private industry;

(4) a significant number of educational institutions have agreed to participate or will participate in the use of the telecommunications system for which assistance is sought;

(5) the eligible telecommunications partnership will have substantial academic and teaching capabilities including the capability of training, retraining, and inservice upgrading of teaching skills;

(6) the eligible telecommunications partnership will serve a multistate area; and

(7) the eligible telecommunications partnership will, in providing services with assistance sought under this Act, meet the needs of groups of individuals traditionally excluded from careers in mathematics and science because of discrimination, inaccessibility, or economically disadvantaged backgrounds.

(d) GEOGRAPHIC DISTRIBUTION.—In approving applications under this title, the Secretary shall assure an equitable geographic distribution of grants.

DISSEMINATION OF COURSES AND MATERIALS UNDER THE STAR SCHOOLS PROGRAM

SEC. 906. (a) Each eligible telecommunications partnership awarded a grant under this Act shall report to the Secretary a listing and description of available courses of instruction and materials to be offered by educational institutions and teacher training centers which will be transmitted over satellite, specifying the satellite on which such transmission will occur and the time of such transmission.

(b) The Secretary shall compile and prepare for dissemination a listing and description of available courses of instruction and materials to be offered by educational institutions and teacher training centers equipped with satellite transmission capabilities, as reported to the Secretary under subsection (a) of this section.

(c) The Secretary shall distribute the list required by subsection (b) of this section to all State educational agencies.

EVALUATION

SEC. 907. (a) EVALUATION.—The Office of Technology Assessment may, upon request, beginning after September 30, 1987, conduct a thorough evaluation of the use of the telecommunications systems supported by grants made under this title.

(b) REPORTS.—The Office of Technology Assessment shall, after a request made under subsection (a), prepare and submit a report to the Congress, on the evaluation authorized by this subsection.

STUDY OF FEASIBILITY OF AN EDUCATIONAL SATELLITE

SEC. 908. (a) The Office of Technology assessment may, upon request, conduct a study and evaluation of the cost of designing, building, and launching a satellite for educational purposes, together with an analysis of—

(1) the demand for the use of a satellite for educational purposes; and

(2) the ability of users to such a system to repay the cost of such a satellite.

(b) If the Office of Technology Assessment finds, after a study and evaluation conducted under subsection (a), that the cost entailed in designing, building, and launching such a satellite could be repaid within 10 years by the potential users of such a satellite, the Office of Technology Assessment shall notify the Congress of its findings.

DEFINITIONS

SEC. 909. As used in this title—

(1) the term "educational institution" means an institution of higher education, a local educational agency, and a State educational agency;

(2) the term "institution of higher education" has the same meaning given that term under section 1201(a) of the Higher Education Act of 1965;

(3) the term "local educational agency" has the same meaning given that term under section 198(a)(10) of the Elementary and Secondary Education Act of 1965;

(4) the term "public broadcasting entity" has the same meaning given that term in section 397 of the Communications Act of 1934;

(5) the term "Secretary" means the Secretary of Education;

(6) the term "State educational agency" has the same meaning given that term under section 198(a)(7) of the Elementary and Secondary Education Act of 1965; and

(7) the term "State" means each of the several States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Virgin Islands, the Trust Territory of the Pacific Islands, and the Commonwealth of the Northern Mariana Islands.

X. MINORITY VIEWS

X. MINORITY VIEWS OF MESSRS. QUAYLE, HUMPHREY AND THURMOND

S. 778 is an unnecessary piece of legislation which the Congress should not pass. Private groups are already providing the types of education envisioned by S. 778, at no expense to the federal government. The current programs which provide satellite transmitted academic courses are widely received and tremendous resources have been committed by schools, colleges, and the private sector to make it work. Federal involvement is unnecessary.

S. 778 is also not a high priority. When we are being forced to consider reductions in federal domestic programs to reduce the deficit and meet the Gramm-Rudman-Hollings budget targets, it is extremely difficult to rationalize creating a new $100 million program.

Should the Congress be able to find an additional $100 million for domestic programs, we feel it would be much better spent on programs that assist the needy in more substantial ways and through existing federal programs. Purchasing telecommunications equipment does not fit into the category of aiding the needy.

Again, we would say that S. 778 is an unnecessary piece of legislation and one that is a very low priority in this day of severe budget deficits.

DAN QUAYLE.
GORDON HUMPHREY.
STROM THURMOND.